

U.S. - China Agricultural Transportation

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The U.S. Department of Agriculture (USDA) has closely followed and reported on the transportation issues related to agricultural trade between the United States and China because efficient transportation is essential to improved trade between the two countries. As Hong Kong became a Special Administrative Region of China in mid-1997, this report reflects the port's status as one of China's own. But with Hong Kong receiving about 74 percent of U.S. containerized agricultural exports for the whole of China, the report in many cases separates out the Hong Kong traffic to better reveal the growing importance of more northern Chinese ports like Shanghai, Qingdao, Dalian, and Xingang. And because China's exports to the United States impact U.S. to China container rates and container availability, inbound trade volumes and rates are included in this report.

From the perspective of the Chinese importer and the U.S. agricultural exporter, the ocean liner industry, composed of shipping lines like COSCO, Maersk-SeaLand, and Hanjin, is a vital link between U.S. farms and the Chinese consumer. Understanding which shipping firms are doing the majority of the business, how products move through Asia to China, at what level shipping firms price their services, and what can be done to lower shipping costs is essential to establishing long-term, profitable marketing operations. This report details how containers, the main mode of transporting high-valued and refrigerated agricultural products, move from the United States to China and how those services are priced.

Major findings in this report are:

** From 1999 to 2000, the number of containers of agricultural products shipped from the United States to China, including Hong Kong, has increased by 9 percent.

** U.S. cotton exports dropped significantly from 1997 to 1999, reflecting a change in Chinese cotton production and import policies which affected all foreign imports. However, cotton exports rebounded in 2000 by 71 percent over the previous year.

** In northern Chinese ports, the volume of U.S. exports increased by 34 percent with leather and hides, animal feed, cotton and grocery items showing strong increases over the previous year.

** In Hong Kong, although imports of U.S. products were up only slightly from 1999 to 2000, shipments of fresh oranges increased by 41 percent while nuts increased by 59 percent. Cotton rebounded into Hong Kong by 103 percent over the previous year.

** COSCO, the principal Chinese national shipping line, has maintained the greater share of traffic to

northern Chinese ports. Competition among the many lines serving China remains strong.

** In 2000, 34 percent of containers were transshipped through other Asian ports (e.g., Pusan, Kobe, Yokohama, Kaohsiung) before arriving in northern Chinese ports.

** Since 1997, the majority (80 to 90 percent) of U.S. agricultural containers arrived in Hong Kong, with the remainder being shipped to other Chinese ports.

** Other ports of entry for U.S. agricultural products include Shanghai, Qingdao, Dalian, Xingang (Tianjin), Huangpu (Guangzhou), Shekou, and Fuzhou.

** Apple rates to Hong Kong are 6 percent lower today, at \$3,257 per container, than they were 4 years ago.

** Apple rates to Hong Kong do not differ dramatically from rates to Taiwan or Singapore. In June 2001, container rates were only slightly lower into Taiwan (10 percent) and slightly higher into Singapore (11 percent).

** Rates for frozen beef shipments to other Asian port destinations were from 19 percent (Hong Kong) to 38 percent (Kaohsiung) lower than to Xingang port, near Tianjin, China.

** The Westbound Transpacific Stabilization Agreement, a “discussion group” of 12 Pacific Ocean shipping lines, announced that in 2000, it intended to increase shipping rates for refrigerated commodities like apples by about \$1,200 this year. Due to competition, rates have increased by less than \$500.

** China’s agricultural exports to the United States, including Hong Kong, totaled 80,788 TEUs in 2000, about 43 percent of what was shipped from the United States to China. Over 85 percent of the products originated from ports other than Hong Kong.

** Nearly 19 percent of all U.S. imports were fish and fish products, while about 12 percent were grocery items. Rates were roughly comparable to Westbound rates for northern Chinese ports but much higher from Hong Kong to the United States.

Major Agricultural Commodities in U.S.-to-China Container Trade: Tables 1 and 2 list the top 10 agricultural commodities shipped in containers from the United States to Chinese ports for calendar years 1999 and 2000. Hong Kong is included in a separate table to better highlight the growing importance of container terminals in the north. Total shipments of containerized agricultural commodities shipped to these Chinese ports, excluding Hong Kong, for 2000 was 44,141 TEUs, a standard measure used in ocean shipping. (See table 1.) This amount of imports from the United States increased 34 percent over the 1999 level but was still down from the 1997 level of 60,330

TEUs.

The decrease in the number of agricultural shipments overall was almost exclusively due to a drop in cotton shipments of more than 33,000 TEUs from 1997 to 2000. In 1997, Chinese agricultural policy makers began encouraging more domestic production and enforcing regulations which restricted foreign imports. Overall, Chinese cotton imports fell from 783,000 tons in 1997 to 52,000 tons in 2000 [Annual Cotton Reports, Foreign Agricultural Service, Beijing].

Top cotton suppliers, the United States, Australia, and Uzbekistan, all reported significant declines in exports to China. The United States, which had achieved a 50-percent share of the Chinese market, was most affected.

Table 1: Top 10 U.S. agricultural commodities shipped to Chinese ports, excluding Hong Kong

Rank	Commodity (Jan -Dec 1999)	TEU*	% of total	Commodity (Jan -Dec 2000)	TEU*	% of total
1	Leather, hides	5,080	15%	Leather, hides	7,406	17%
2	Animal feed	4,689	14%	Animal feed	6,886	16%
3	Frozen poultry	3,973	12%	Frozen fish	5,886	13%
4	Cotton	2,629	8%	Frozen poultry	3,926	9%
5	Fish meal	2,560	8%	Cotton	3,392	8%
6	Frozen potatoes	2,130	6%	Fish meal	2,462	6%
7	Frozen fish	2,054	6%	Frozen potatoes	2,443	6%
8	Dairy products	1,603	5%	Grocery items	1,689	4%
9	Sunflower seeds	992	3%	Dairy products	1,504	3%
10	Grocery items	913	3%	Sunflower seeds	917	2%
	Other ag commodities	6,215	19%	Other ag commodities	7,631	17%
	Total	32,839	100%	Total	44,141	100%

*TEU = 20-foot equivalent container unit. Both 20-foot and 40-foot containers are regularly used in the U.S.-China trades. A 20-foot container generally weighs between 9 and 15 tons depending on the commodity. (Source: PIERs, Journal of Commerce, New York)

Despite the overall decline in U.S. cotton exports to China from 1997 levels, other product lines were able to achieve significant gains. From 1999 to 2000, leather and hides increased 46 percent, animal feed increased by 47 percent, and even cotton experienced a 29 percent rebound. Grocery items (which include foodstuffs, pastes, sauces, and soups) continued as a strong beginner in the trade with an 85 percent increase over the year before. Traditional imports, like frozen fish, frozen poultry, fishmeal, frozen potatoes, and dairy products, all maintained approximate levels with the year before.

Imports of U.S. agricultural products into China through the port of Hong Kong present a significantly different picture than through other Chinese ports. Higher valued products, like frozen poultry, fresh fruit, citrus, fresh and frozen vegetables, grocery items, nuts and beef, replace lower valued commodities, like cotton, hides, and grain products. (See table 2.) Although imports of U.S. products were up only slightly from 1999 to 2000, shipments of fresh oranges increased by 41 percent while

nuts increased by 59 percent. Cotton rebounded into Hong Kong by 103 percent over the previous year. Frozen poultry, grocery items, and beef showed some decline but overall exports remained fairly stable.

Table 2: Top 10 U.S. agricultural commodities shipped to Hong Kong

Rank	Commodity (Jan -Dec 1999)	TEU*	% of total	Commodity (Jan -Dec 2000)	TEU*	% of total
1	Frozen poultry	67,565	49%	Frozen poultry	57,649	41%
2	Fresh fruit	12,869	9%	Fresh oranges	14,490	10%
3	Vegetables	9,381	7%	Fresh fruit	12,934	9%
4	Grocery items	7,048	5%	Hides, leather	7,717	6%
5	Hides, leather	6,817	5%	Vegetables	7,654	6%
6	Beef	4,672	3%	Cotton	7,140	5%
7	Fresh oranges	4,411	3%	Grocery items	6,239	4%
8	Dairy products	4,013	3%	Beef	4,461	3%
9	Cotton	3,508	3%	Dairy products	3,657	3%
10	Nuts	1,715	1%	Nuts	2,735	2%
	Other ag commodities	16,423	12%	Other	14,250	10%
	Total	138,421	100%	Total	138,927	100%

*Source: PIERS, Journal of Commerce, New York

Major Shipping Lines in the U.S.-to-China Trades: A major advantage of the ocean container shipping market is the degree of competition that exists. Competition among shipping lines tends to drive down shipping rates and increase services. Policies of the Governments of China and the United States encourage the services of worldwide shipping lines to call at each nation's ports, allowing shippers a wide range of shipping services and more frequent service. Table 3 lists the top 10 shipping lines serving the U.S.-China trade in 1999 and 2000, excluding Hong Kong.

Because carriers sometimes specialize in services (refrigerated containers versus non-refrigerated or dry containers) or commodities (some carriers have contracts with major shippers of cotton, grain products, fruits, or other products), the ranking of top shipping lines is likely to change from year to year. COSCO, the principal Chinese national shipping line, has maintained the greater share of traffic for Chinese ports, excluding Hong Kong. Other carriers, like Maersk-SeaLand, Hanjin, American President Lines (APL), and Hyundai were all top shipping firms in 2000, with market shares differing only slightly from 1999. Even with the SeaLand merger with Maersk and APL merger with Neptune Orient Lines, the U.S.-to-China trade exhibits good competition among shipping firms carrying agricultural products. Most of these same carriers serve Hong Kong, and competition among carriers at that port is as good as or better than most northern ports, given the size of the Hong Kong market.

Table 3: Top 10 shipping lines for Chinese ports, excluding Hong Kong, 1999 and 2000

Rank	Shipping Line (Jan -Dec 1999)	TEU*	Market Share	Shipping Line (Jan -Dec 2000)	TEU*	Market Share
1	COSCO	6,744	21%	COSCO	10,721	24%
2	Hanjin Shipping Co. Ltd.	3,893	12%	Maersk-SeaLand	4,496	10%
3	Maersk-SeaLand	3,842	12%	Hanjin Shipping Co. Ltd.	3,199	7%
4	NOL-APL	3,245	10%	Hyundai	3,050	7%
5	Hyundai	2,823	9%	NOL-APL	3,006	7%
6	MOL	1,893	6%	OOCL	2,979	7%
7	Evergreen	1,595	5%	MOL	2,160	5%
8	Senator Lines	1,411	4%	Evergreen	2,083	5%
9	OOCL	1,285	3%	Senator Lines	1,745	4%
10	Yang Ming Line	1,204	3%	Yang Ming Line	1,733	4%
	Other	4,904	15%	Other	8,971	20%
	Total	32,839	100%	Total	44,141	100%

On May 1, 1999, new U.S. regulations concerning all ocean shipping companies that call on U.S. ports took effect. Probably the most dramatic event relating to the regulations has been the demise of ocean shipping cartels, notably the Transpacific Westbound Rate Agreement which dominated pricing in the U.S.-to-Asia trades. Ocean carriers are still allowed to meet and discuss rate levels and capacity in the trades but the cartels are much less disciplined, and carriers do not necessarily have to maintain standard rate levels. These changes have largely been brought about by newer, more liberal confidential contracting arrangements, which are now possible between shippers and ocean carriers. Industry analysts believe that 80 to 90 percent of all container movements will eventually occur under contract. U.S. exporters and Chinese importers should explore establishing contractual shipping services with one or several carriers as a way of reducing rates or setting service standards. Shipper associations, whether for import or export, are being explored and formed to pool container volumes and enhance shipper bargaining power when negotiating with carriers.

Major U.S.-to-China Shipping Routes: Tables 4 and 5 list the amount of direct versus transshipped containers and the major transshipment points from 1998 to 2000 into Chinese ports other than Hong Kong. Hong Kong has been excluded from the table to better reveal shipments into other Chinese ports which are of growing importance. In 2000, 34 percent of containers shipped primarily from U.S. West Coast ports had to be transshipped through other Asian ports before arrival. Shallow port depth, inadequate container handling equipment, and the lack of sufficient China-bound cargos per ship are the primary reasons ocean liner companies prefer to transfer containers onto smaller vessels from the larger (4,000 to 6,000 TEU) vessels which regularly leave the United States. The trend to ship through foreign ports has remained relatively steady since 1998. Pusan, Kobe, Yokohama, and Kaohsiung are in a good geographic position to benefit from the increasing trade between the United States and northern Chinese cities. Port market shares for these transshipment cargos vary from year to year given the particular shipping lines which are moving the containers and the efficiency and cost of transshipping through any particular port.

Table 4: Direct versus Transshipped Containers into Chinese Ports, 1998-2000 (excluding Hong Kong)						
	1998	Share	1999	Share	2000	Share
	Direct	64%	Direct	60%	Direct	66%
	Transshipped	36%	Transshipped	40%	Transshipped	34%

Source: PIERs, Journal of Commerce, New York

Table 5: Major Foreign Transshipment Ports into Chinese Ports, 1998-2000 (excluding Hong Kong)						
Rank	1998	Share	1999	Share	2000	Share
1	Pusan	36%	Pusan	39%	Pusan	45%
2	Yokohama	19%	Kobe	25%	Kobe	26%
3	Kobe	15%	Kaohsiung	11%	Yokohama	16%
4	Kaohsiung	12%	Yokohama	11%	Kaohsiung	6%
5	Other	18%	Other	14%	Other	7%
	Total	100%	Total	100%	Total	100%

Source: PIERs, Journal of Commerce, New York

Major Chinese Ports of Entry: Since 1998, the majority (about 80 to 90 percent) of U.S. agricultural cargoes first arrived in Hong Kong, with the remainder being shipped to other Chinese ports (table 6). Despite the growing efficiency of other Chinese container ports, Hong Kong has increased its share of cargos landed in China from 82 percent in 1998 to 91 percent in 2000. Hong Kong (along with Singapore) handles nearly 15 million containers (TEUs) of all commodities per year, almost three times as much as their closest competitors, Kaohsiung, Rotterdam, and Pusan. Shanghai ranks around 10th in the world for number of containers handled at approximately 3 million TEUs per year.

Other ports of entry for U.S. agricultural products include Shanghai, Qingdao, Dalian, Xingang (Tianjin), Huangpu (Guangzhou), Shekou, and Fuzhou. Market shares among these ports have varied only slightly over the last 3 years with the exception of Shanghai which significantly increased its market share over the last year. All ports are looking to increase their container handling capacity, with Shanghai, Xingang, and Dalian planning extensive investments in new terminal capacity through joint ventures [Drewry Shipping Consultants, 1999].

Table 6: First Port of Entry, Hong Kong versus Other Chinese Ports, 1998-2000						
	1998	Share	1999	Share	2000	Share
	Hong Kong	82%	Hong Kong	81%	Hong Kong	91%
	Other Ports	18%	Other Ports	19%	Other Ports	9%

Source: PIERS, Journal of Commerce, New York

Table 7: First Port of Entry for Chinese Ports, Excluding Hong Kong, 1998-2000						
Rank	1997	Share	1998	Share	2000	Share
1	Qingdao	32%	Qingdao	25%	Shanghai	42%
2	Shanghai	18%	Shanghai	17%	Qingdao	34%
3	Tianjin/Xingang	15%	Tianjin/Xingang	11%	Dalian	7%
4	Dalian	7%	Dalian	9%	Tianjin/Xingang	7%
5	Fuzhou	4%	Guangzhou/Huangpu	6%	Shekou	3%
6	Guangzhou/Huangpu	3%	Fuzhou	4%	Fuzhou	2%
7	Other	21%	Other	28%	Other	6%
	Total	100%	Total	100%	Total	100%

Source: PIERS, Journal of Commerce, New York

The Cost of Exporting to China: As mentioned previously, Hong Kong's large container throughput, mainly as a transshipment center for Southeast Asia and other Chinese ports, translates directly into cost savings for products shipped into Hong Kong and its environs. In table 8, the rates charged by ocean carriers serving selected Asian ports are compared for apples.

In the case of apple shipments from Seattle, WA, to Hong Kong, rates to Hong Kong do not differ significantly from rates to Taiwan or Singapore. In June 2001, the rates to Hong Kong (\$3,257) were higher than into Taiwan (by 10 percent) and lower than into Singapore (by 11 percent). Because some of the ports differ considerably in distance from the United States, the rates to these ports were divided by statute mile distances to compute a "cost-per-mile" figure for a representative container of apples. Discounting distance in this way, the cost was \$0.58 per mile to Hong Kong and \$0.55 per mile into Taiwan. It should be emphasized that using a cost-per-mile figure has its limitations because a vessel may stop at one or more ports before it arrives at a particular port or containers may be transhipped from another country.

Apple rates to Hong Kong are lower today than they were 4 years ago by only about 6 percent. Since September 1997, apple rates have dropped from a high of \$3,475 to a low of \$2,634 in May of 1998. Over the past 3 years, apple rates to Hong Kong have risen significantly to \$3,257 in June 2001. The Westbound Transpacific Stabilization Agreement, a "discussion group" of 12 Pacific Ocean shipping lines, announced publicly on May 16, 2000, that they intended to increase refrigerated shipping rates for commodities like apples by about \$1,200 in 2001. Although many carriers sought

such an increase, the net effect was less than \$500 per container because of competition from other carriers.

Table 8: Ocean Container Rates for Apples from Seattle to Select Asian Ports, June 2001*

Country	Apple rate June 2001	\$ difference from Hong Kong rate	% difference from Hong Kong rate	Distance (st. miles)	Cost per mile
Taiwan	\$2,915	-342	-10%	5261	\$0.55
Hong Kong	\$3,257	-----	-----	5635	\$0.58
Singapore	\$3,583	362	11%	7014	\$0.51

* Weighted average for one 40-foot container by market share of all carriers serving trade lane for this commodity based on tariffs filed by ocean carriers, June 2001.

Table 9 compares the rates for frozen beef shipments to Xingang port, near Tianjin, China, versus other Asian port destinations. Rates to other destinations were from 19 percent (Hong Kong) to 38 percent (Kaohsiung) lower than to Xingang. Beef rates to Xingang in June 2001 were about \$800 more per container than a year ago.

Table 9: Container Rate for Frozen Beef from California to Select Asian Ports, 2001

Asian Port	Beef rate June 2001	\$ difference from Xingang rate	% difference from Xingang rate
Xingang	\$5,246	-----	-----
Hong Kong	\$4,231	-\$1,015	-19%
Kaohsiung	\$3,271	-\$1,975	-38%
Singapore	\$5,840	\$594	10%

* Weighted average for one 40-foot container by market share of all carriers serving trade lane for this commodity based on tariffs filed by ocean carriers, June 2001.

The necessity to transship Xiangang containers through these other major ports or other transshipment ports increases the cost per container into Xiangang. Currently, this may be the cheapest way of providing service to the port. As traffic volumes increase and the port's container terminals increase their capacity to handle larger ships on mainline routes, rates will eventually decrease in comparison to these larger container hubs.

China to U.S. Agricultural Shipping: China's agricultural exports to the United States, including Hong Kong, totaled 80,788 TEUs in 2000, about 43 percent of what was shipped from the United States to China. Over 85 percent of the products originated from Chinese ports other than Hong Kong. Nearly 19 percent of all U.S. imports were fish and fish products, while about 12 percent were grocery items (e.g., foodstuffs, pastes, sauces, and soups). Other products include herbs, spices, canned vegetables, canned fruit, and other higher-valued or processed products.

Frozen seafood rates from Qingdao to Southern California ports were \$5,308 per container on average

in August 2001. This is comparable to the \$5,246 beef rate from Southern California to the nearby Chinese port of Xingang. Frozen seafood rates from Hong Kong to Southern California were considerably more at \$7,514 per container. Apple rates, quoted previously, from Washington State to Hong Kong were 56 percent less at \$3,257 per refrigerated container.

Selecting an Ocean Carrier: Although international traders are optimistic that the economic and political climate is right for northern Chinese port investment, importers and exporters must continue to deal with relatively higher ocean freight rates relative to other Asian ports in the region. Selecting an ocean carrier with the lowest cost that delivers superior services is no easy task. Carriers are continuously changing the rates they charge and their shipping schedules to take advantage of shifting trade volumes and opportunities for increased profits. U.S. exporters who are selling the product at a delivered price are faced with which shipping line to select. Many times, however, Asian importers are quoted agricultural commodity prices based on which carrier they select, so it is important for the importer to have knowledge of carrier performance and cost. Table 10 is representative of monthly reports, called the *Ocean Freight Rate Bulletin*, published by USDA to better inform importers and exporters about ocean services and rates for specific commodities between specific destinations.

Each Bulletin lists all ocean carriers (e.g., COSCO, Maersk-SeaLand, APL) participating in a particular trade (e.g., Seattle/Takoma ports to Hong Kong) for a particular commodity and the market share for the shipping line. Each bulletin lists the number of TEUs that were shipped the previous month along with the total shipped so far for the year. Transit times between the United States and the destination ports are also listed for each carrier. The ocean rate is then calculated based on a per-container rate along with ancillary charges like Bunker (fuel) Adjustment Factors, Container Yard Receiving charges, Currency Adjustment Factors, and any other charges that apply.

Table 10: Fresh apples: Seattle/Takoma ports to Hong Kong, China (July 2001)

<i>Total CY2001 as of June: 649</i>	COSCO	Maersk-SeaLand	APL	Evergreen	Hyundai
<i>Total June 2001: 140</i>					
Market Share - June 2001	33%	31%	16%	11%	9%
Transit time	21 days	16 days	13 days	16 days	17 days
Ocean rate (per container)	\$3,460	\$2,800	\$3,510	\$2,500	\$3,100
Surcharge(s):					
BAF/container	\$140	\$140	\$140	\$140	\$140
Chassis charge/container	\$40	\$40	\$40	\$40	N/A
Container rate (based on 18 tons/40ft.)	\$3,640	\$2,980	\$3,690	\$2,680	\$3,240

Notes: TEU=20-foot equivalent units for month/year; BAF= Bunker (fuel) Adjustment Factor.

With this information, a shipper can see which carriers are in a particular market, how much of the

market they command, approximately how long the product will be in transit, and what prices ocean carriers charge. *Ocean Freight Rate Bulletins* are currently produced for apples, almonds, beef, cherries, cotton, frozen potatoes, grapes, grapefruit, lemons, lettuce, oranges, pears, pistachios, poultry, and raisins. Bulletins are only produced during major shipping periods for fresh fruits and other products. Also, there must be sufficient activity in a particular trade to warrant the production of a Bulletin.

Bulletins are available by mail from USDA or on the Internet at <http://www.ams.usda.gov/tmd/Ocean/Index.htm>. Another useful publication posted on the Internet is the *Directory of Freight Forwarders Serving Agricultural Shippers* (1999). The directory has recently been formatted to work as an interactive database that will allow the user to search for freight forwarders who handle agricultural products by the commodity they generally handle and region of the world they generally serve. The vast majority of U.S. exporters use freight forwarders as do many importers. This publication and many others that may prove useful to U.S. exporters to China and Chinese importers may be found at <http://www.ams.usda.gov/tmd/tmdsea.htm>.

Summary: After the U.S. exporter or Chinese importer finds and establishes a close relationship with a reliable U.S. supplier of the commodity to be imported, an ocean carrier must be selected who will deliver the product on time, in good condition, and at the lowest cost. This analysis, which dealt mainly with the ocean carrier industry that serves the U.S.-China trade, is designed to profile existing ocean services and costs and assist both importer and exporter in selecting the most appropriate carrier.

(Questions or comments regarding this analysis should be directed to Jim Caron, Transportation and Marketing Programs, AMS/USDA, 202-690-1315/fax 690-1340, or Internet: Jim.Caron@USDA.gov, [Commodity, carrier, and ocean rate data compiled by Heidi Reichert, Ron Hagen, and April Taylor, Ocean Freight Rate Bulletin Team, USDA], August 27, 2001)